

**MUNICIPAL POLICE OFFICERS'  
RETIREMENT SYSTEM  
of the  
STATE OF MONTANA**

**ACTUARIAL VALUATION  
as of June 30, 2005**

Prepared by

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October 4, 2005

Retirement Board  
Municipal Police Officers' Retirement System  
State of Montana

Dear Members of the Board:

At your request, we have completed an actuarial valuation of the Municipal Police Officers' Retirement System as of June 30, 2005. Details about the actuarial valuation are contained in the following report.

I certify that the information included in this report is complete and accurate to the best of my knowledge and belief. All calculations have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the applicable Standards of Practice adopted by the American Academy of Actuaries.

Milliman has been engaged by MPERA as an independent actuary. The undersigned is a Fellow of the Society of Actuaries, a Member of the American Academy of Actuaries, and an Enrolled Actuary, and is experienced in performing actuarial valuations for large public employee retirement systems.

Actuarial computations presented in this report are for purposes of analyzing the sufficiency of future contributions. Actuarial computations under GASB Statement No. 25 are for purposes of fulfilling financial accounting requirements. The computations in this report have been made on a basis consistent with our understanding of the Retirement Board's funding policies and GASB Statement No. 25. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, different determinations may be needed for other purposes.

Any distribution of this report must be in its entirety, including this cover letter, unless prior written consent is obtained from Milliman.

Respectfully submitted,

Mark O. Johnson, F.S.A., M.A.A.A., E.A.  
Principal and Consulting Actuary

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**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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**ACTUARIAL CERTIFICATION**

To the best of our knowledge and belief, this report is complete and accurate and contains sufficient information to fully and fairly disclose the funded condition of the Municipal Police Officers' Retirement System as of June 30, 2005.

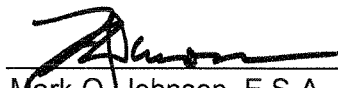
In preparing the valuation, we relied upon the financial information, membership data, and benefit provisions furnished by the System. Although we did not audit this data, we compared the data for this and the prior valuation and tested for reasonableness. Based on these tests, we believe the data to be sufficiently accurate for the purposes of our calculations. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

The Retirement Board has sole authority to determine the actuarial assumptions and methods used for the valuation of the System. The Board adopted all of the actuarial methods and assumptions used in the 2005 valuation.

The findings have been determined according to actuarial assumptions and methods that were chosen on the basis of recent experience of the System and of current expectations concerning future economic conditions. In our opinion, the assumptions used in the actuarial valuation are appropriate for purposes of the valuation, are internally consistent, and reflect reasonable expectations. The assumptions represent our best estimate of future conditions affecting the System. Nevertheless, the emerging costs of the System will vary from those presented in this report to the extent that actual experience differs from that projected by the assumptions.

The actuarial valuation was prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the applicable Standards of Practice adopted by the Actuarial Standards Board of the American Academy of Actuaries. In addition, the assumptions and methods used meet the parameters set for disclosures by Governmental Accounting Standards Board Statement No. 25.

The undersigned is an independent actuary, a Fellow of the Society of Actuaries, a Member of the American Academy of Actuaries, an Enrolled Actuary, and experienced in performing valuations for large public employee retirement systems.



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Mark O. Johnson, F.S.A., M.A.A.A., E.A.  
Principal and Consulting Actuary

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**SECTION 1**  
**SCOPE OF THE REPORT**

This report presents the results of our actuarial valuation of the System as of June 30, 2005.

A summary of the findings resulting from this valuation is presented in Section 2 of the report and the underlying calculations are summarized in more detail in Section 3.

All of the calculations of the valuation were carried out using certain assumptions as to the future experience of the System in matters affecting the actuarial cost. Section 4 summarizes the most important of these assumptions and describes the actuarial methods used to calculate costs.

Section 5 outlines the benefit provisions of the System.

The membership data which were supplied to us are summarized in Section 6.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**SECTION 2**  
**SUMMARY OF FINDINGS AND ANALYSIS OF THE FUNDING LEVEL**

The costs of a retirement system are not determined by the actuary. The ultimate costs of a system are determined by adding all of the benefits and expenses that are paid, and subtracting all investment earnings. These costs cannot be determined exactly until the last member or beneficiary has received the final benefit payment due.

The purpose of an actuarial valuation is to provide a timely best estimate of the ultimate costs in order to allocate them to the appropriate generation of members and taxpayers. The ideal goal is for contributions to remain essentially a constant percentage of covered payroll as long as the assumptions and methods reflect the emerging experience of the system and its members with reasonable accuracy.

**MEMBERSHIP DATA**

We have developed the following comparisons between the membership in this and the prior actuarial valuations:

	<u>June 30, 2005</u>	<u>June 30, 2004</u>
Number of Members		
Retirees and Beneficiaries	575	571
Vested Terminated	26	20
Non-vested Terminated	35	38
Active	<u>605</u>	<u>603</u>
Total Membership	1,241	1,232

More detailed membership statistics are shown in Section 6.

**DETERMINATION OF NORMAL COST**

The **Normal Cost** represents the cost assigned to an average member for a given year such that it would meet the continuing costs of that particular benefit, if contributed each year starting with the date of membership. The Entry Age Actuarial Cost Method is designed to produce a Normal Cost that remains a level percentage of salaries, so it is best expressed as a rate.

The following chart shows the Normal Cost from the 2004 valuation compared to the Normal Cost in this valuation. **TABLE 1** provides more details on the Normal Cost.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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	<b>2005 Actuarial Valuation</b>	<b>2004 Actuarial Valuation</b>
<b>Normal Cost Rate</b>		
Service Retirement	20.82%	20.98%
Disability Retirement	1.68	1.66
Death	1.04	1.03
Withdrawal	<u>2.06</u>	<u>2.10</u>
<b>Total Normal Cost Rate</b>	<b>25.60%</b>	<b>25.77%</b>

The decline in the Normal Cost Rate is primarily due to members electing the DROP. The Normal Cost Rate is expected to remain fairly stable as long as the benefits are not amended, experience emerges as assumed, the demographic characteristics of the membership remain reasonably consistent, and the actuarial assumptions are not changed.

**DETERMINATION OF THE ACTUARIAL LIABILITY**

The next step in the actuarial valuation process is to project all future benefit payments from the System for current members and retirees. The level of benefits currently being paid is known, but assumptions are needed to estimate how long they will be paid, and the amount and timing of the payment of future benefits for active and inactive members who are not currently receiving payments.

The summation of the discounted values of all of the projected benefit payments for all current members, at the assumed rate of return, is called the **Actuarial Present Value of Projected Benefits**. Details are shown in **TABLE 2** and summarized below.

(\$000)	<b>2005 Actuarial Valuation</b>	<b>2004 Actuarial Valuation</b>
<b>Actuarial Present Value of Projected Benefits</b>		
Retired Members	\$ 164,511	\$ 157,443
Inactive Members	2,467	2,324
Active Members	<u>168,919</u>	<u>157,374</u>
<b>Total Value of Projected Benefits</b>	<b>\$ 335,897</b>	<b>\$ 317,141</b>

The **Actuarial Present Value of Future Normal Costs** is the value of all remaining Normal Costs expected to be received over the future working lifetime of current active members. The Actuarial Present Value of Future Normal Costs is subtracted from the Actuarial Present Value of Projected Benefits to arrive at the **Actuarial Liability**, the assets that would exist if the current Normal Cost Rate had been paid for all members since entry into the System, and if all actuarial assumptions had been realized. The following is a summary from **TABLE 2**.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

(\$000)	2005 Actuarial Valuation	2004 Actuarial Valuation
Actuarial Present Value of:		
Projected Benefits	\$ 335,897	\$ 317,141
Future Normal Costs	<u>59,518</u>	<u>57,047</u>
<b>Actuarial Liability</b>	<b>\$ 276,379</b>	<b>\$ 260,094</b>

**DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS**

The next step in the valuation process is to calculate the **Actuarial Value of Assets** that will be used to determine the funding status of the System. The market value of assets was reported to us as of June 30, 2005. However, because the underlying calculations in the actuarial valuation are long-term in nature, it is advantageous to smooth out short-term fluctuations in the market value of assets.

The asset smoothing method projects an Expected Value of Assets using the assumed rate of investment return, then recognizes the difference between the Expected Value and the Market Value over a four-year period. The calculation of the Actuarial Value of Assets is shown in **TABLE 3** and summarized below.

(\$000)	Gain or (Loss)	Reserve Factor	Smoothing Reserve	Value of Assets
<b>Market Value on June 30, 2005</b>				\$ 161,815
2002-03	\$ (1,179)	25%	\$ (295)	
2003-04	5,834	50%	2,917	
2004-05	(299)	75%	<u>(224)</u>	
Smoothing Reserve			2,398	<u>(2,398)</u>
<b>Actuarial Value of Assets</b>				<b>\$ 159,417</b>

**UNFUNDED ACTUARIAL LIABILITY OR ACTUARIAL SURPLUS**

The **Unfunded Actuarial Liability** is the excess of the Actuarial Liability over the Actuarial Value of Assets, which represents a liability that must be funded over time. Contributions in excess of the Normal Cost are used to amortize the Unfunded Actuarial Liability.



**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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An **Actuarial Surplus** exists if the Actuarial Value of Assets exceeds the Actuarial Liability. The calculation of the Unfunded Actuarial Liability or Actuarial Surplus is shown in **TABLE 4** and summarized below.

(\$000)	<b>2005 Actuarial Valuation</b>	<b>2004 Actuarial Valuation</b>
Actuarial Liability	\$ 276,379	\$ 260,094
Actuarial Value of Assets	<u>159,417</u>	<u>149,510</u>
<b>Unfunded Actuarial Liability or (Actuarial Surplus)</b>	<b>\$ 116,962</b>	<b>\$ 110,584</b>
 <b>Funded Ratio – Actuarial Value</b>	<b>58%</b>	<b>57%</b>
 <b>Funded Ratio – Market Value</b>	<b>59%</b>	<b>57%</b>

The **Funded Ratio** is equal to the Actuarial Value of Assets divided by the Actuarial Liability. A funded Ratio of 100% means the Actuarial Value of Assets equals the Actuarial Liability, and the System could be financed by contributions equal to the Normal Cost, if all future experience emerges as assumed.

A Funded Ratio over 100% indicates the System has an Actuarial Surplus.

#### **ACTUARIAL GAINS AND LOSSES**

Comparing the Unfunded Actuarial Liability as of two valuation dates does not provide enough information to determine if there were actuarial gains or losses. The correct comparison is between the Unfunded Actuarial Liability on the valuation date and the Expected Unfunded Actuarial Liability projected from the prior valuation date using the actuarial assumptions in effect for the one-year period.

**TABLE 5** shows the Actuarial Liability as of June 30, 2004, and the elements to project that figure forward to June 30, 2005: the Normal Cost, less benefits paid, plus a charge for interest at the assumed rate of 8% per year. The same table shows the Actuarial Value of Assets as of June 30, 2004, and the elements to project that figure forward to June 30, 2005: The net cash flow (contributions less benefits and expenses), plus a charge for interest at the assumed rate of 8%.

The following is a summary of the actuarial gains or losses during the one-year period.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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	(\$000)
<b>Unfunded Actuarial Liability</b>	
Actual as of June 30, 2004	\$ 110,584
Expected as of June 30, 2005	\$ 111,681
Actual as of June 30, 2005	<u>116,962</u>
<b>Actuarial (Gain) or Loss</b>	<b>\$ 5,281</b>
<b>(Gain) or Loss by Source</b>	
Investment Loss	\$ 3,883
Liability Loss	<u>1,398</u>
Net from All Sources	<b>\$ 5,281</b>

**CALCULATION OF CONTRIBUTION RATE**

The statutory funding rate is tested in the valuation to determine if it is sufficient to cover the Normal Cost Rate plus an amortization payment for the Unfunded Actuarial Liability, if any, over no more than 30 years. The calculations are shown in **TABLE 6** and summarized below.

Rates as a Percentage of Active Member Payroll	2005 Actuarial Valuation	2004 Actuarial Valuation
<b>Statutory Funding Rate</b>	52.78%	52.78%
<b>Normal Cost Rate</b>	<u>25.60</u>	<u>25.77</u>
<b>Available for Amortization</b>	27.18%	27.01%
<b>UAL (Surplus) (\$000)</b>	\$116,962	\$110,584
Years to Amortize	23.9	24.4
Rate of Amortization	27.18%	27.01%
<b>Calculated Contribution Rate</b>		
Normal Cost Rate	25.60%	25.77%
Rate of Amortization	<u>27.18</u>	<u>27.01</u>
<b>Total Contribution Rate</b>	52.78%	52.78%

Based on the assumptions contained in this report, the current statutory funding rate of 52.78% of payroll is sufficient to fund the current and projected benefits from the System.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**DISCLOSURE INFORMATION - GASB No. 25**

The disclosure of the Schedule of Funding Progress calculated in accordance with Statement No. 25 of the Governmental Accounting Standards Board and is shown in **TABLES 7 AND 8**.

The Annual Required Contribution is equal to the Statutory Funding Rate of 52.78% for the 2004-05 fiscal year because the statutory funding rate met the parameters of Statement No. 25 in the previous valuation.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**SECTION 3**  
**ACTUARIAL VALUATION RESULTS**

The following tables document the findings of the actuarial valuation.

TABLE 1	NORMAL COSTS
TABLE 2	SUMMARY OF ACTUARIAL REQUIREMENTS
TABLE 3	ACTUARIAL VALUE OF ASSETS
TABLE 4	UNFUNDED ACTUARIAL LIABILITY OR ACTUARIAL SURPLUS
TABLE 5	ACTUARIAL GAINS AND LOSSES
TABLE 6	CALCULATION OF CONTRIBUTION RATE
TABLE 7	SCHEDULE OF FUNDING PROGRESS
TABLE 8	SOLVENCY TEST

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**TABLE 1**  
**NORMAL COSTS**

	<b>2005 Actuarial Valuation</b>	<b>2004 Actuarial Valuation</b>
<b>Normal Cost Rate</b>		
Service Retirement	20.82%	20.98%
Disability Retirement	1.68	1.66
Death	1.04	1.03
Withdrawal	<u>2.06</u>	<u>2.10</u>
<b>Total Normal Cost Rate</b>	25.60%	25.77%
 <b>Annual Normal Cost (\$000)</b>	 \$ 6,823	 \$ 6,455
 <b>Present Value of Future Normal Costs (\$000)</b>	 \$ 59,518	 \$ 57,047

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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**TABLE 2**  
**SUMMARY OF ACTUARIAL REQUIREMENTS**

(\$000)	2005 Actuarial Valuation	2004 Actuarial Valuation
<b>Retired Members</b>		
Service Retirement	\$ 118,766	\$ 112,110
Disability Retirement	20,791	20,466
Beneficiaries	<u>24,954</u>	<u>24,867</u>
Retired Member Total	\$ 164,511	\$ 157,443
<b>Inactive Members</b>	\$ 2,467	\$ 2,324
<b>Active Members</b>		
Service Retirement	\$ 153,626	\$ 142,862
Disability Retirement	5,907	5,562
Pre-retirement Death	3,640	3,446
Withdrawal	<u>5,746</u>	<u>5,504</u>
Active Member Total	\$ 168,919	\$ 157,374
<b>Present Value of Future Projected Benefits</b>	\$ 335,897	\$ 317,141
Present Value of Future Normal Costs	<u>59,518</u>	<u>57,047</u>
<b>Actuarial Liability</b>	\$ 276,379	\$ 260,094

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**TABLE 3**  
**ACTUARIAL VALUE OF ASSETS**

(\$000)

<b>Fiscal Year</b>	<b>Cash Flow</b>	<b>Expected Value</b>	<b>Gain or (Loss)</b>	<b>Market Value</b>
2001-02				\$ 119,980
2002-03	\$ 1,755	\$ 131,404	\$ (1,179)	130,225
2003-04	1,859	142,577	5,834	148,411
2004-05	1,759	162,114	(299)	161,815

<b>Fiscal Year</b>	<b>Gain or (Loss)</b>	<b>Reserve Factor</b>	<b>Smoothing Reserve</b>
2002-03	\$ (1,179)	25%	\$ (295)
2003-04	5,834	50%	2,917
2004-05	(299)	75%	<u>(224)</u>
			\$ 2,398

<b>Fair Market Value on June 30, 2005</b>	\$ 161,815
<b>Less, Asset Smoothing Reserve</b>	<u>(2,398)</u>
<b>Actuarial Value of Assets on June 30, 2005</b>	\$ 159,417

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**TABLE 4**  
**UNFUNDED ACTUARIAL LIABILITY OR ACTUARIAL SURPLUS**

(\$000)	2005 Actuarial Valuation	2004 Actuarial Valuation
<b><u>Actuarial Value</u></b>		
Actuarial Liability	\$ 276,379	\$ 260,094
Actuarial Value of Assets	<u>159,417</u>	<u>149,510</u>
Unfunded Actuarial Liability or (Actuarial Surplus)	\$ 116,962	\$ 110,584
Funded Ratio (AV)	58%	57%
<b><u>Market Value</u></b>		
Actuarial Liability	\$ 276,379	\$ 260,094
Market Value of Assets	<u>161,815</u>	<u>148,411</u>
Unfunded Actuarial Liability or (Actuarial Surplus)	\$ 114,564	\$ 111,683
Funded Ratio (MV)	59%	57%



**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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**TABLE 5**  
**ACTUARIAL GAINS AND LOSSES**

(\$000)	<u>Expected</u>	<u>Actual</u>	<u>(Gain) or Loss</u>
<b>2004 Actuarial Liability</b>	\$ 260,094		
Normal Cost	6,455		
Benefits Paid	(12,149)		
Expected Earnings at 8%	<u>20,581</u>		
<b>Actuarial Liability</b>	\$ 274,981	\$ 276,379	\$ 1,398
 <b>2004 Actuarial Value of Assets</b>	 \$ 149,510		
Net Cash Flow	1,759		
Expected Earnings at 8%	<u>12,031</u>		
<b>Actuarial Value of Assets</b>	<u>163,300</u>	<u>159,417</u>	<u>3,883</u>
 <b>Unfunded Actuarial Liability or (Actuarial Surplus) as of June 30, 2005</b>	 \$ 111,681	 \$ 116,962	 \$ 5,281
 <b>Summary Actuarial (Gain) or Loss by Source</b>			
Investment (Gain) or Loss			\$ 3,883
Liability (Gain) or Loss			<u>1,398</u>
Total Actuarial (Gain) or Loss			\$ 5,281

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**TABLE 6**  
**CALCULATION OF CONTRIBUTION RATE**

	<b>2005 Actuarial Valuation</b>	<b>2004 Actuarial Valuation</b>
<b>Statutory Funding Rate</b>		
<b>Members (average)</b>	9.00%	9.00%
<b>Employers</b>	14.41	14.41
<b>State</b>	<u>29.37</u>	<u>29.37</u>
<b>Total</b>	52.78%	52.78%
<b>Normal Cost Rate</b>	<u>25.60</u>	<u>25.77</u>
<b>Funding Rate Available for Amortization</b>	27.18%	27.01%
<b>Unfunded Actuarial Liability (Surplus) (\$000)</b>	116,962	\$110,584
Years to Amortize	23.9	24.4
Rate of Amortization Contribution or (Credit)	27.18%	27.01%
<b>Calculated Contribution Rate</b>		
Normal Cost Rate	25.60%	25.77%
Amortization Payment	<u>27.18</u>	<u>27.01</u>
Total Calculated Rate	52.78%	52.78%

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

**DISCLOSURE INFORMATION - GASB No. 25**

**TABLE 7**  
**SCHEDULE OF FUNDING PROGRESS**  
**(DOLLARS IN THOUSANDS)**

Actuarial Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Funded Ratio	Unfunded AAL (UAAL)	Covered Payroll	UAAL as a Percentage of Covered Payroll
June 30, 1996	\$ 70,068	\$105,664	66%	\$35,596	\$15,828	225%
June 30, 1998	94,908	173,642	55	78,735	17,873	441
June 30, 2000	129,826	181,109	72	51,283	20,252	253
June 30, 2002	143,516	226,827	63	83,311	22,229	375
June 30, 2004	149,510	260,094	57	110,584	24,531	451
June 30, 2005	159,417	276,379	58	116,962	26,198	446

**TABLE 8**  
**SOLVENCY TEST**  
**(DOLLARS IN THOUSANDS)**

	(1)	(2)	(3)		Coverage Ratios		
Actuarial Valuation Date	Active Member Accounts	Inactive Actuarial Liability	Employer Financed Active Liability	Actuarial Value of Assets	(1)	(2)	(3)
June 30, 1996	\$ 9,333	\$ 57,474	\$38,856	\$ 70,068	100%	100%	8%
June 30, 1998	11,397	110,650	51,595	94,908	100	76	0
June 30, 2000	18,465 <sup>(1)</sup>	118,855	43,789	129,826	100	94	0
June 30, 2002	20,854	144,055	61,918	143,516	100	85	0
June 30, 2004	23,317	159,767	77,010	149,510	100	79	0
June 30, 2005	24,368	166,978	85,033	159,417	100	81	0

Note:

- (1) Prior to 2000, "active member accounts" included Regular Contributions without interest for active and inactive members. Beginning in 2000, "active member accounts" includes Regular and Additional Contributions with interest, and excludes all accounts of inactive members.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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**SECTION 4**  
**ACTUARIAL METHODS AND ASSUMPTIONS**

This section of the report describes the actuarial methods and assumptions used in this valuation. These methods and assumptions have been chosen by the Retirement Board based on our recommendations. The Retirement Board has the sole authority to select the methods and assumptions used in this actuarial valuation. The recommendations were formed on the basis of recent experience of the System and on current expectations as to future economic conditions.

The assumptions are intended to estimate the future experience of the System and the members of the System in areas which affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of the System's benefits.

In our opinion, the current actuarial methods and assumptions are reasonable and appropriate for this System. The assumptions were developed in accordance with generally recognized and accepted actuarial principles and practices that are consistent with applicable Standards of Practice adopted by the American Academy of Actuaries.

**RECORDS AND DATA**

The data used in the valuation consist of financial information and records of age, service and income of contributing members, former contributing members and their survivors. All of the data were supplied by the System and are accepted for valuation purposes without audit.

**ACTUARIAL COST METHOD**

A fundamental principle in financing the liabilities of a retirement program is that the cost of its benefits should be related to when they are earned, rather than when they are paid. There are a number of methods in use for making a determination.

The funding method used in this valuation is the Entry Age Cost Method. Under this method the actuarial present value of projected benefits for each individual member included in the valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this actuarial present value allocated to a valuation year is called the Normal Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future Normal Costs is called the Actuarial Liability.

The excess of the Actuarial Liability over the Actuarial Value of Assets is called the Unfunded Actuarial Liability. If the Actuarial Value of Assets exceeds the Actuarial Liability, the difference is called the Actuarial Surplus.

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION AS OF JUNE 30, 2005**

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**ASSET VALUATION METHOD**

Asset values were supplied by the System and were accepted without audit by us. The Actuarial Value of Assets is the market value, adjusted by a four-year recognition of gains and losses.

**INVESTMENT RETURN**

The future investment earnings of the assets of the plan are assumed to accrue at a net annual rate of 8%, net of all administrative and investment-related expenses.

**INTEREST ON MEMBER CONTRIBUTIONS**

Interest on member contributions is assumed to accrue at a net annual rate of 5%.

**CAPITAL PRESERVATION PREMIUM ON DROP ACCOUNTS**

DROP accounts are assumed to earn the rate of return on the trust fund net of expenses plus 1.5% to cover the minimum 0% earnings guarantee on DROP accounts.

**FUTURE SALARIES**

Estimates of future salaries are based on two types of assumptions. Rates of increase in the general wage level of the membership are directly related to inflation, while individual salary changes due to promotion and longevity, referred to as the merit scale, occur even in the absence of inflation. The assumed increase in future salaries due to general wage growth is 4.25% per year. The merit scale, assumed in addition to general wage growth, is shown below.

<u>Service</u>	<u>Merit Scale</u>
1	7.3%
2	5.6
3	4.4
4	3.5
5	2.8
6	2.2
7	1.7
8	1.3
9	1.0
10	0.7
11-15	0.4
16-20	0.2
After 20	0.0

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**MORTALITY**

The probabilities of mortality are based on the following published tables:

Healthy Retirees and Non-Retired Members	
Males	1994 Male Uninsured Pensioner Table (-1)
Females	1994 Female Uninsured Pensioner Table
Disabled Retirees	
Males	1994 Male Uninsured Pensioner Table (+3)
Females	1994 Female Uninsured Pensioner Table (+2)
Beneficiaries	
Males	1994 Male Uninsured Pensioner Table (-1)
Females	1994 Female Uninsured Pensioner Table (-1)

Age	Healthy Members		Beneficiaries		Disabled Retirees	
	Male	Female	Male	Female	Male	Female
50	0.250%	0.154%	0.250%	0.141%	0.385%	0.186%
55	0.428	0.247	0.428	0.224	0.677	0.314
60	0.762	0.477	0.762	0.415	1.234	0.627
65	1.391	0.929	1.391	0.819	2.135	1.157
70	2.336	1.476	2.336	1.367	3.355	1.775
75	3.661	2.439	3.661	2.192	5.399	3.050
80	6.007	4.236	6.007	3.802	8.872	5.285
85	9.636	7.284	9.636	6.557	13.654	9.035
90	14.995	12.502	14.995	11.247	21.333	15.266
95	23.194	20.023	23.194	18.352	30.675	23.619

**SERVICE RETIREMENT**

The assumed rates of retirement used in this valuation are shown below.

Age	w/ 20 Yrs	Age	w/ 20 Yrs
Under 50	20%	60	20%
50 - 54	25	61	20
55	20	62	20
56	20	63	20
57	20	64	20
58	20	65 & over	100%
59	20		

All vested terminated members are assumed to retire when first eligible for an unreduced benefit.

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**DROP RETIREMENT**

33% of all active members are assumed to elect to enter the DROP upon first attainment of 20 years of service. These members are assumed to elect to participate in the DROP plan for five years. Members who have elected to participate in the DROP as of the valuation date are assumed to remain in the DROP until the end of the DROP period elected, unless they die or become disabled while in the DROP.

**DISABLEMENT**

The assumed rates of disablement are illustrated below at specified ages. We further assume that 10% of all disabilities are duty-related. We also assume that all disabilities are permanent, and no disabled member will recover and return to work.

<u>Age</u>	<u>Male</u>	<u>Female</u>
22	-	-
27	0.10%	0.10%
32	0.10	0.10
37	0.10	0.10
42	0.40	0.40
47	0.40	0.40
52	0.40	0.40
57	0.40	0.40
62	0.00	0.00

**OTHER TERMINATIONS OF MEMBERSHIP**

The assumed rates of termination, other than for retirement, death, or disability, are shown in the following table.

<u>Service</u>	<u>All Members</u>
0	10%
1	7
2	7
3	6
4	5
5-9	3
10-14	1
15 & over	1

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The probability of a terminating member electing a refund of the member account balance is shown in the following table.

<b>Age at Termination</b>	<b>Non-Vested</b>	<b>Vested</b>
Under 35	100%	70%
35 - 39	100	60
40 - 44	100	40
45 - 49	100	40
50 & over	100	-

**PROBABILITY OF MARRIAGE**

100% of all non-retired members are assumed to be married. Male spouses are assumed to be four years older than female spouses.

**Changes in Actuarial Assumptions Made for this Valuation**

The following method and assumptions were revised since the last valuation:

**Actuarial Methods**

- ◆ None

**Economic Assumptions**

- ◆ None

**Demographic Assumptions**

- ◆ None



**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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**SECTION 5**  
**SUMMARY OF BENEFIT PROVISIONS**

All of the calculations contained in this report are based on our understanding of the benefit and eligibility provisions of the system. The provisions used in this valuation are summarized below for reference purposes.

<b>Service Retirement</b>	Eligibility:	20 years of membership service regardless of age or 5 years of membership service and age 50
	Benefit:	Years of service credit, multiplied by 2.5%, multiplied by
		(a) if hired before July 1, 1977: Average monthly compensation during final year of service, or
		(b) if hired on or after July 1, 1977: Average regular monthly compensation (for last consecutive 36 months).
	Normal Form:	Monthly benefit for the life of the member, with full benefits continuing to the surviving spouse or dependent children upon the death of the member.
<b>Disability Retirement</b>	Eligibility:	Immediate
	Benefit:	If hired before July 1, 1977: Minimum of 50% of base salary.
		If hired on or after July 1, 1977: Minimum of 50% of final average compensation.
<b>Death before Retirement</b>	Eligibility:	Immediate
	Benefit:	If hired before July 1, 1977: Minimum of 50% of base salary.
		If hired on or after July 1, 1977: Minimum of 50% of final average compensation.

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<b>Termination Benefit</b>	Eligibility:	Prior to 5 years of membership service
	Benefit:	Return of member contributions with interest.
	Eligibility:	5 years of membership service
	Benefit:	Either (a) or (b) below:  (a) Return of member contributions with interest, or  (b) Actuarial equivalent of the accrued benefit based on a retirement age of 50.
<b>Benefit Adjustments</b>	Eligibility:	Retired members and beneficiaries.
	Benefit:	Either (a) or (b) below, as elected by the member:  (a) An annual adjustment (GABA) of 3.0%, commencing one year after retirement for members hired on or after July 1, 1997, or if elected by the member, or  (b) 50% of the salary of a newly confirmed police officer in the city in which the member was employed.
<b>Contributions</b>	Members:	Either (a), (b), (c), (d), or (e) below:  (a) If hired prior to June 30, 1975: 5.80% of members' compensation, or  (b) If hired after June 30, 1975 and prior to July 1, 1979: 7.00% or  (c) If hired after June 30, 1979 and prior to July 1, 1997 8.50%, or  (d) If hired on or after July 1, 1997: 9.00%, or  (e) For members electing the GABA, 9.00%
		Employers: 14.41% of members' compensation.
		State: 29.37% of members' compensation.

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**DROP**

Eligibility : 20 years of membership service

Benefits: Eligible members may elect to participate in the DROP for a period of up to 5 years.

A monthly DROP service retirement allowance is calculated based on the member's compensation and service at the beginning of the DROP period. This monthly benefit is deposited into a DROP account. The DROP account also is credited with investment earnings equal to the rate of earnings on the trust fund, but not less than 0% in any fiscal year.

The monthly DROP benefit receives GABA or minimum benefit adjustments that would apply if the member was receiving a service retirement benefit during the DROP period.

If the member dies or becomes disabled during the DROP period, the accumulated DROP account as of the date of death or disability is payable to the member or the member's beneficiary, plus the DROP annuity with increases as applied through the date of death or disability is payable to the disabled member or to the deceased member's survivors, if any.

At the end of the DROP period the DROP account is paid to the member, and the member begins receiving a monthly retirement benefit equal to the monthly DROP benefit with all GABA or minimum benefit adjustments made during the DROP period, and the monthly benefit continues to receive GABA or minimum benefit adjustments thereafter.

Contributions: During the DROP period, member, employer, and state contributions continue to be made to the trust fund at the same rates as for any other active plan member.

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**SECTION 6**  
**SUMMARY OF MEMBERSHIP DATA**

The following tables depict the participant data that was used in the valuation. Table 9 is a history of participant characteristics for the System. Tables 10A and 10B display the distribution of Active Members by age and service showing average annual salaries. Table 11 is a distribution of retirees by age, showing average monthly benefits. Table 12 is a distribution of Vested Inactive Members by age.

**TABLE 9**  
**MEMBERSHIP HISTORY**

	<u>2005</u>	<u>2004</u>	<u>2002</u>	<u>2000</u>	<u>1998</u>	<u>1996</u>
<b>Active Members</b>						
Number	605 <sup>(1)</sup>	603	585	571	545	527
Average Age	38.8	38.3	37.6	37.2	37.1	-
Average Service	10.2	9.9	9.4	9.3	9.3	-
Average Salary	\$42,815	\$40,371	\$37,870	\$35,376	\$32,795	\$30,011
<b>Inactive Members</b>						
Service Retirement	353	347	336	323 <sup>(2)</sup>	476	448
Disability Retirement	81	82	81	84 <sup>(3)</sup>	25	30
Survivors	141	142	137	134 <sup>(4)</sup>	29	29
Vested Deferred	26	20	18	15	10	6
Non-vested Terminated	<u>35</u>	<u>38</u>	<u>71</u>	<u>58</u>	<u>49</u>	<u>34</u>
Total Inactive Members	636	629	643	614	589	547
<b>Total Membership</b>	1,241	1,232	1,228	1,185	1,134	1,074

Notes:

- (1) Includes 570 regular active members and 35 active members in the DROP.
- (2) Beginning in 2000, service retirements exclude members who originally retired on a disability, and beneficiaries of members who died after retirement.
- (3) Beginning in 2000, disability retirements include all members who originally retired on a disability, regardless of their current age.
- (4) Beginning in 2000, survivors include beneficiaries of members who died after retirement, as well as beneficiaries of members who died prior to retirement.

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**TABLE 10A**  
**DISTRIBUTION OF ACTIVE MEMBERS**

Age	Years of Service							
	Under 5		5 to 9		10 to 14		15 to 19	
	Number	Average Salary	Number	Average Salary	Number	Average Salary	Number	Average Salary
Under 25	11	35,665	-	-	-	-	-	-
25-29	57	35,062	5	38,964	-	-	-	-
30-34	73	35,694	36	42,019	8	47,580	2	38,709
35-39	34	35,841	57	39,481	62	45,413	6	46,512
40-44	17	33,560	20	42,720	31	44,010	30	50,047
45-49	7	38,050	5	38,262	15	48,936	30	49,659
50-54	2	34,272	5	39,599	4	41,943	7	48,003
55-59	3	46,361	-	-	-	-	4	50,946
60-64	-	-	-	-	-	-	-	-
65-69	-	-	-	-	-	-	-	-
70 & over	-	-	-	-	-	-	-	-
Totals	204	35,586	128	40,638	120	45,520	79	49,209

Age	Years of Service							
	20 to 24		25 to 29		30 & Up		All Years	
	Number	Average Salary	Number	Average Salary	Number	Average Salary	Number	Average Salary
Under 25	-	-	-	-	-	-	11	35,665
25-29	-	-	-	-	-	-	62	35,377
30-34	-	-	-	-	-	-	119	38,457
35-39	-	-	-	-	-	-	159	41,281
40-44	10	52,663	1	44,110	-	-	109	44,600
45-49	11	53,682	3	51,577	-	-	71	48,263
50-54	2	39,400	4	66,720	-	-	24	46,500
55-59	3	56,202	2	54,259	3	56,932	15	52,719
60-64	-	-	-	-	-	-	-	-
66-69	-	-	-	-	-	-	-	-
70 & over	-	-	-	-	-	-	-	-
Totals	26	52,482	10	57,424	3	56,932	570	41,966

**MONTANA MUNICIPAL POLICE OFFICERS' RETIREMENT SYSTEM**  
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**TABLE 10B**  
**DISTRIBUTION OF ACTIVE DROP MEMBERS**

Age	Years of Service							
	20 to 24		25 to 29		30 & Up		All Years	
	Number	Average Salary	Number	Average Salary	Number	Average Salary	Number	Average Salary
Under 25	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	-	-
35-39	-	-	-	-	-	-	-	-
40-44	1	50,064	-	-	-	-	1	50,064
45-49	5	59,254	1	46,989	1	40,388	7	54,807
50-54	4	48,125	7	59,917	3	60,305	14	56,631
55-59	4	56,858	3	58,901	4	58,634	11	58,061
60-64	-	-	1	51,539	1	65,561	2	58,550
66-69	-	-	-	-	-	-	-	-
70 & over	-	-	-	-	-	-	-	-
Totals	14	54,733	12	57,888	9	57,933	35	56,638

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**TABLE 11**  
**DISTRIBUTION OF RETIRED MEMBERS**

<u>Age</u>	<u>Service Retirees</u>		<u>Disabled Retirees</u>		<u>Survivors</u>	
	<u>Number</u>	<u>Average Monthly Benefit</u>	<u>Number</u>	<u>Average Monthly Benefit</u>	<u>Number</u>	<u>Average Monthly Benefit</u>
Under 40	-	-	2	1,518	1	1,337
40-44	6	2,014	5	1,623	3	1,397
45-49	15	1,904	6	1,387	4	1,315
50-54	56	2,107	9	1,426	8	1,141
55-59	89	2,048	20	1,396	11	1,632
60-64	49	1,940	7	1,347	9	1,370
65-69	38	1,602	16	1,371	14	1,566
70-74	38	1,666	7	1,470	18	1,442
75-79	34	1,577	4	1,447	29	1,466
80-84	18	1,473	2	1,677	24	1,469
85-89	6	1,464	2	1,412	11	1,475
90-94	3	1,658	1	1,329	6	1,410
95-99	-	-	-	-	3	1,167
Unknown	1	1,186	-	-	-	-
<b>TOTALS</b>	<b>353</b>	<b>1,856</b>	<b>81</b>	<b>1,422</b>	<b>141</b>	<b>1,447</b>

**TABLE 12**  
**DISTRIBUTION OF VESTED INACTIVE MEMBERS**

<u>Age</u>	<u>Number</u>
Under 30	-
30-34	5
35-39	11
40-44	3
45-49	5
50-54	1
55-59	1
60-64	-
65-59	-
70 & over	-
<b>Total</b>	<b>26</b>